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Here, on Mt. Rose, Nevada, Dr. J. E. Church made the first western snow survey 50 years ago

# FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEY and WATER SUPPLY FORECASTS for

# MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE.

and

MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

JAN. 1, 1959

#### UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

#### PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS RIVER BASINS	ISSUED	COOPERATIN	G WITH	LOCATION
COLORADO, RIO GRANDE	MONTHLY (FEBMAY)	COLO. STATE		FT. COLLINS, COLO.
COLUMBIA Includes Alaska	MONTHLY (JAN MAY)	IDAHO STATE	ENGINEER	BOISE, IDAHO
UPPER MISSOURI	MONTHLY (FEB MAY)	Mont.Agr.Exp	STATION	BOZEMAN, MONTANA
WEST-WIDE	(OCT. 1. APR. 1 AND MAY 1)	COOPERATORS		PORTLAND, OREGON
STATES				
ARIZONA	SEMI.MONTHLY (Jan. 15-Apr.1)			PHOENIX, ARIZONA
NE VADA	MONTHLY (FEB APR.).	NEVADA STATE	ENGINEER	RENO. NEVADA
ORE GON	MONTHLY (JANMAY)	ORE.AGR.EXP.S	STATION	PORTLAND, OREGON
UTAH	Monthly (JanMay)	UTAH STATE EN UTAH AGR.EXP.	GINEER STATION	SALT LAKE CITY, UTAH
Washington	Monthly (FEBMay)	Wash. State [ of Conservati	DEPT.	SPOKANE, WASHINGTON
WYOMING	Monthly (Feb. June).	WYOMING STATE	E ENGINEER	CASPER, WYOMING
Copies of th	e various reports may be	So	il Conservation Se	

#### PUBLISHED BY OTHER AGENCIES

OTHER SNOW SURVEY REPORTS	
BRITISH COLUMBIAMONTHLY	(FEBJUNE)
CALIFORNIAMonthly	(FEBMAY)

#### FEDERAL-STATE-PRIVATE COOPERATIVE

#### SNOW SURVEYS and WATER SUPPLY FORECASTS

for

#### MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd Hydraulic Engineer Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

H. D. Hurd State Conservationist of Montana

O. W. Monson
Irrigation Engineer
Montana Agricultural
Experiment Station

R. E. Huffman
Director
Montana Agricultural
Experiment Station



#### WATER SUPPLY OUTLOOK

FOR MONTANA
January 1, 1959

#### MISSOURI RIVER BASIN

The 1959 snow-pack over the Missouri River Basin is approximately 71 percent average for January first.

Comparing the few key snow survey courses measured this early in the season with January 1958, snow on the Jefferson Basin is 82 percent of last year and 73 percent of an average January.

The 1959 snow-pack over the Madison River Basin is 60 percent of last year and 57 percent of an average January.

#### COLUMBIA RIVER BASIN

The 1959 snow-pack on the Columbia River Basin in Montana is approximately 103 percent of January 1958 and 100 percent of the average for January.

The 1959 snow-pack on the Flathead River Basin is 113 percent of last year and 117 percent of an average January.

On the Clark Fork Basin the 1959 snow-pack is 100 percent of last year and 96 percent of the January average.

The Gibbons Pass snow course at the head of the Bitterroot River Basin shows 37 inches of snow with 9.5 inches of water content. The figures indicate that the snow-pack is 87 percent of last January and 85 percent of the January average.





# INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

						111	DEV	10 1	VIOIVIAIV	11 Q	. 140		1111.		,, -				W		Locati Sec.	.on	Range	Record	Measuring	Measured
Orainage Basin	Montan		Loca Sec.		Range				Drainage Basin	Montana		Locat.	_	Range	Record	Measuring Datee	Measured By	Drainage Basin and Course Name	Montana Number	Elev.	Lat.	Twp.	Long.	Began	Dates	By
and Course Name JEFFERSON RIVER	Number		Let.			Began	Dates	By	and Course Name	Number	Elev.	Lat.	Twp.		Began					MISSOUR	RIVER I	RAINAGE	(cont.)			
(ROCK-BEAVER	HEAD)	745	2010	VER DICK	114.12				(UPPER YELLOWS	•	rii 3000ni	ng viza o	oc. racus	(00)				(TONGUE RIVER		9200	29	55N	90W	1956	2,3,4,5	1
Lakeview Bidgo	11E3	7400	27	143	2W	1948	3,4,5	10	Camp Senia	9DL	7890	. 2	83	188	1937 1938	1,2,3,4,5	1 6	Horse Trail Div. Lake Geneva	761.9 761.6 751.5	9000 8800	7	52N 55N	86W 89W	1956 1956	2,3,4,5 2,3,4,5	1
Lakeview Canyon Limekiln White Pine Ridge	11E4 12E2 12E1	6930 6950 8850	26 5 18	11:3 153 11:3	2W 9W 9W	1948 1948 1948	3,4,5 3,4,5 3,4 3,4	10	Canyon Cooke City	10E3 10D7 10D5	7750 7400 8400	ելև • – ելև 25 22	9S 9S	110°-30	1937 1935	1,2,3,4,5	6 <b>2</b>	North Tongue Sibley Lake	7E11 7E12	8000 9000	10 19	55N 55N	88W 87W	1956 1956	2,3,4,5 2,3,4,5	1
(HORSE PRAIR		0.7,00	10	Щ	7"	1740	<i>4 و ر</i>	1	Crevice Mt. Independence Lake Camp	10D6 10E4	8000 7850	22 144.°-34.1	7S	12E 110°-24	1940 • 1936	1,2,3,4,5	1 6 6	Sucker Creek Steamboat Point Wood Rock G.S.	7610 7613	7500 8500	32 3	56N 54N	87W 88W	1956 1956	2,3,4,5 2,3,4,5	1
Bloody Dick	13010	7600	12	83	16W	1948	3,4	1	Lupine Creek Lodgepole	10E1 9E1	7300 8200	35 37 37	56N	110°-37		2,3,4,5	1,4	(POWDER RIVER)	) Wyoming							
Oold Stono Lemhi Pass Terrell Creok	13D9 13E1 13012	8100 7480 6650	11 9 1/4	83 108 93	16W 15W 15W	1948 1948 1948	يار 3 بار 3	1	(SHIELDS RIVER	:)						•		Crazy Woman	6E2	8200 7800	6	1.7N 1.8N	8LIN 8LIN	1956 1956	2,3,4,5 2,3,4,5	1
Trail Creek Selway Junction	13E2 13D11	7090 6800	15 27	103 88	15W	1948 1948	3,4 3,4 3,4	1 1	Porcupine	1003	6500	10	LN	10E	1938	3,4	1	Muddy Creek G.S. Munkers Pase	6E1 7E8 7E36	9700 8300	11 20	48N 47N	85W 85W	1950 1956	2,3,4,5 2,3,4,5	1
(BIO HOLE)							-,-		LOWER YELLOWSTONE									North Powder #2 Onion Gulch Soldier Park	7E27 7E5	8100 8700	31 36	18N 51N	85W 85W	1956 1950	2,3,4,5	1
Big Hole Pass Big Nole Pass-Be.	13D3 13D4	7240 6900	28 24	35 38	18W 18W	1948 1948	3,1,	1	(WIND RIVER) W		9800	26	L2N	109W	1955	2,3,4,5	1	Sour Dough	7E6	8500	17	19N	.v. 817M	1936	2,3,4,5	1
East Boundary Glbbons Pass	1305 1302	6700 7100	22	3S 23	17W 19W	1948 1934	3,4 3,4 1,2,3,4,5	1,3	Big Warm Breoke Lake #3 Burroughs Creek	9F12 10F8 9F4	8800 9200 8800	36 23 15	LILIN LIJN	110W 107W	1939 1948	2,3,4,5	1			COL	UMBIA RI	VER BASI	<u>.n</u>			
Jahnke Oreek Minor Forks	1308 1306	7340 7300	25 24	73 (3	16W 17W	1948 1948	3,4 3,4	1	Dinwoodie Dry Creek	9 <b>F1</b> 0 9 <b>F9</b>	10000 9500	21 34	39N Цл	105W 6W	1948 1948	2,3,4,5	1	KOOTENAI RIVER	15B11	5500	6	25N	30W	1956	4.5.5	3 2
Miner Lake (WISE RIVER)	1307	6720	10	63	16W	1945	3,4,5	1	DuNoir East Fork	986 9813	8750 9200	27 23	Ц2N LLLN	108W	1940 1956	2,3,4,5	1	Baree Creek Baree Mountain Red Mountain	15B1 15A1	6000	1	25N 36N	31W 29W	1937 1937	4,5,5 4,5,5 3,4,5,5	1 2 2 1,2
Anderson Mdw.	13014	7000	18	38	12W	1948	3,4	1	Geyser Creek Little Warm Sheridan R.S. #1	9F7 9F8 9 <b>F</b> 5	8500 9500 <b>7500</b>	24 3	7511 7711 7711	108W 108W 109W	1948 1948 1939	2,3,4,5 2,3,4,5 2,3,4,5	i 1	Weasel Divide	11 <sub>4</sub> A7	5450	8	37N	5 FM	1955	3,4,5,5 4,5,5	1,2
Elk Horn Wiso River	13D15 13O13	8450 6300	15 15	48 23	12W 12W	1935 1948	3,4,5 3,4	3	Sheridan R.S. #2 T-Grees Ranch	9F14 9F3	7500 8000	3	42N 43N	109W 107W	1955 1940	2,3,4,5	1	FLATHEAD RIVER Basin Creek	13B14A	5000	11	19N	12W	1951	2,3,4,5	2
(EUBY RIVER)									Togwotee Pass	1079	9600	29	LiliN	110₩	1936	2,3,4,5	11	Big Cresk Brush Creek	13B3 14A4	6750 5000	6&7 13	30N	18W 26W	1941 1937	3,4,5 3,4,5	5 1,2
Flashlight	1203	6950	22	83	7W	1945	3,4,5	1	(POPO AGIE RIV		-	0.3	2237	10111	2020	2 2 1. 6	1	Cattle Queen Oesert Mountain	13A1 13A2M	4700 5600 5770	24	35N 31N 32N	17W 19W 22W	1939 1937 1942	3,4,5 1,2,3,4,5 3,4,5	6 1,2 1,2
MADISON RIVER									Blue Ridge Bruce's Camp Hobb'e Park	802 805 903	9500 6500 10000	23 24 22	31N 32N 2S	101W 101W 3W	1939 1955 1948	2,3,4,5 2,3,4 2,3,4,5	1 1	Hell Roaring Div. Holbrook Kishenehn	14A3 13B13A 14A6	4530 3886	35 18 14	21N 37N	13W 22W	1951	1,2,3,4,5 4,5	2
Hebgen	11E5	6550	22	113	3E	1934	1,2,3,4,5	3	Mosquito Park R.S. Sawmill Olade		9500 8500	23	2S 31N	3W 101W	1940	2,3,4,5 2,3,4,5	1	Logan Creek Harias Pass	14A5 13A5M	4300 5250	34 34	30N 30N	24W 14W	1937 1934	3,4,5 1,2,3,4,5	2
West Yellowstone Norris Basin	11E7 10E2	6700 7500	11101111	138	5E 110°-42'	1934 1936	1,2,3,4,5 3,4	6	South Pase St. Lawrence	803 9F11	9000 9000	13 26	30N 1N	101W	1939 1940	2,3,4,5	1	Mineral Creek Quintonkon	13A16 13A13	14000 3800	29 11	35N 26N	17W 17W	1957 1951	3,4,5 2,3,4,5	6 1,2
									Trout Creek (OWL CREEK) Wyo	902 md.ng	8400	5	2S	2W	1948	2,3,4,5	1	Strawberry Lake	13B2M 13A10	7000 6500	23	25N 28N	15W 19W	1948 1948	3,4,5 3,4,5	1,2
GALLATIN HIVER									Beavere Mill Owl Creek	9F2 8F1	8900 8700	6 36	43N 43N	102W 101W	1948 1948	2,3,4,5 2,3,4,5	1	Trinkus Lake Trout Lake Twin Creeks	13B1 13A12M	6500 3600	21	25N 28N	17W 17W	1948 1948	3,4,5 3,4,5	2 1,2
Devil's Slide Hood Mendow	1004 1003	8100	1/4	58	6E	1935	2,3,4,5	2,1	(GREYBULL RIVER		-100	,,,	4511	1014	1/40	-,,,,,,	-	Upper Holland Lk.	13B11 13B5	3580 7000	14 28	20N	16W 16W	1951 1948	2,3,4,5 3,4,5	1,2
New World 21-Mile	1001 11E6	6600 6700 7150	22 24 1	4S 3S 11S	6E (Æ SE	1935 1939	2,3,4,5	2,1 7	Timber Creek #1	9E2	8800	25-	47N	103W	1948	2,3,4,5	1	CLARK FORK Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5	. 2
		12,0	•	110	36	1934	1,2,3,4,5	3	Timber Greek #2 Weod River #1 Wood River #2	9E3 9F1 9F15	8800 8000	25 28 28	47N 46N	103W	1955 1939	2,3,4,5	1	Baree Mountain Coyote Hill	15B1 13B10	6000 4200	1	25N 18N	31W 16W	1937 1952	1,2,3,4,5	2 2
MISSOURI RIVER MAI				4					(SHOSNONE RIVER		8000	20	46N	103W	1956	2,3,4,5	1	El Dorado Mine Fred Burr Pass	1309 13011	7800 8000	23 12	8N 6N	12W 13W	1949 1957	3,4,5	1
Oheseman Heservoir Crystal Lake Grasshoppor	901 1002	6200 6100 7000	2 19 19	8N 12N 9N	5W 18E 8E	1936	1,2,3,4,5 3,4	3 1,2	East Entrance	1066	7000	17	52N	109W	1948	1,2,3,4,5	6	Freezeout Summit Oold Creek Lk. Hoodoo Creek	15B10 13C10 15C1	6800 7200	1) <sub>1</sub>	15N 8N	27W 12W	1937 1949	4,5	2
Kings Hill Picnic Grounds	1001	7950 6500	35 10	1:3N 5N	7E 6W	1938 1934 1941	3,4 3,4,5 2,3,4	3	(NOWOOD CREEK)	10E5	7100	12	52N	110W	1936	1,2,3,4,5	6	Intergaard Lubrecht Forest #6	13CL	6200 6450 4400	9 6 11	1/1 N 2 N 1/1 N	27W 13W 15W	1937 1936 1951	2,3,4	12 12
Pipestone Pans Stemple Pans	1201 1201	7200 6900	11 16	1N 13N	7W 7W	1938 1934	2,3,4,5	1 3	Cold Springs Oamp	Wyoming 7E25	8700	1	SON	88W	1956	0.31.4		North Fork Jocko	13B7	6330	3	17N	17W	1941	1,2,3,4,5 3,4,5	5
Ten Mile Oreek L Ten Mile Croek M Ten Mile Croek U	1202 1203 120h	6250 6800 8000	13 13	8n 8n 8n	6W	1935 1934	1,2,3,4,5	3	Medicine Lodge Lke Munkers Pase	7E2L 7E8	9500 9700	7 11	51N 48N	87W 85W	1956 1950	2,3,4,5 2,3,4,5 2,3,4,5	1	Pipestone Pass Red Lion	12D1 13C12	7200 7000	10 27	1 N 6 N	7W 13W	1938 1958	2,3,4,5 3,4,5	1
(TETON RIVER)	1204	0000	19	ON	5W	1935	1,2,3,4,5	3	North Powder Onion Gulch	7E36 7E27	8300 8100	20 31	47N 48N	85W 85W	1956 1956	2,3,4,5	1	Slide Rock Mt. Southern Croes Stemple Pass	1302 1305	7100 6500	35 8	10N 5N	16W 13W	1937 1936	4 2,3,4	1 4
Freight Crack	1241	6000	13	26N	low	1948	3,4	1	Tensleop Lake Tansloep R.S. Tyrell R.S.	7E26 7E7 7E35	9075 8300 8300	33 30 30	50N 49N 49N	86W 86W 86W	1956 1935	2,3,4,5 2,3,4,5	1	Storm Lake Stuart Mill	1201 1307 1306	6900 7780	16 19	13N 4N	7W 1.3W	1934 1939	3,4,5 2,3,4	3 1
Waldron Creek West Fork	12B2 12B1	5600 6000	16 6	25N 25N	9₩ 9₩	1948 1948	3,4 3,4	1	(SHELL CREEK) W		0300	50	4711	DOM	1956	2,3,4,5	1	Stuart Mountain TV Mountain	1301 14B1	6500 7400 6800	19 6 33	5N 1払N 15N	13W 18W 19W	1936 1936	2,3,4	1,2
(SUN RIVER)									Bald Mountain	7E21	9600	33	56N	91W	1956	2,3,4,5	1	East Fork R.S.	1301	5400	16	2N	17W	1956 1937	1,2,3,4,5	1
Benchmark Cabin Creek	12B8 12B6	5500 5400	9 33	20N 23N	10W	1948 1949	يارو بارو	1	Beaver-Tongue Div. Bone-Spring Div. Granite Creek Camp	7E20 7E18 7E22	9200 9200	12 32	55N 55N	91₩ 89₩	1956 1956	2,3,4,5	i	Cibbons Pass Lolo Pass Nez Perce Camp	13D2 14C5	7100 5230	և 16	2S 38N	19W 15E	1934	1,2,3,4,5 3,4,5,5	3,1
5-Bull Gates Park Goat Mountain	12B9 12B5	5600 5300	36 31	20 N 24 N	10W	1948 1949	3,4 3,4 3,4 3,4 3,4	1,2	Granite Pase Norse-Trail Div.	7E17 7E19	7800 8950 9200	15 19 29	53N 514N 55N	89₩ 88₩ 90₩	1956 1956 1956	2,3,4,5	1	Nez Perce Pass Powell R.S.	7/107 7/107 1/105	5580 6575	19&20 32	1S 28 N	23W 17E	1937 1937	3,4,5 1,2,3,4,4½,5	1
Wrong Ridge Wrong Creek	12B7 12B3 12B4	7000 6800 5700	20 17 32	22N 25N 25N	10M 10M	1934 1949 1949	3,4 3,4	3 1,2	Ranger Creek Shell Creek	7EL 7E23	8800 9600	32 12	53N 52N	88W 88W	1935 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	Skalkaho Summit	1303	1230 7259	33 30	37N 6N	14E 17W	1956 1937	3,4,5,5) 4	2
(MARIAS RIVER)		,,,,,	<i>)</i> -	25"	104	1747	3,4	1,2	(PORCUPINE CREE	K) Wyoming	3				-,,-	-929492	1	CM MADY DELE		SA	SKATCHEW	AN RIVER	BASIN			
Marias Pass	13A5M	5250	34	30N	лħМ	1934	1,2,3,4,5	3	Five Spgs. Falls Medicine Wheel	7E31 7E30	7500 9000	19 24	56N 56N	92W	1956	2,3,4,5	1	ST. MARY RIVER  Iceberg Lake #3								
(MILK RIVER)									(TONGUE RIVER)		,,,,,	Ed	JON	92W	1956	2,3,4,5	1	Josephine Upper Josephine Lower #0	13A3 13A15 13A14	5600 5000	48°-50'		1130-421	1956	5	3,9
Rocky Boy	9 <b>A</b> l	5200	15	28N	165	1941	3,4	7	Beaver Tongue Div.	7£20	9200	12	55N	91W	1956	2,3,4,5	1	Mount Allen #7 Piegan #6	13A7 13A6	4900 5700 5500	480-461		1130-411	1955 1922	5	3,9
(MUSSELSHELL RI									Big Goose #2 Bone-Spring Div.	7E2 7E32 7E18	7700 7700	4	53N 53N	86W 86W	1935 1955	2,3,4,5 2,3,4,5	1	Ptarmigan #8	13A8	5800	180-16 <del>5</del>		1730-777。 1730-777。	1922 1937	5	3,9 3,9
Grasshopper	1002	7000	19	9N	3.8	1938	3,4	2	Burgess R.S. #1 Burgess R.S. #2	781 7833	9200 7900 7900	32 36 36	55N 56N 56N	89W 89W 89W	1956 1950 1955	2,3,4,5 2,3,4,5	1	A. Nimana?	1-1							
									Dome Lake #1 Dome Lake #2	7E3 7E34	8800 6800	11	53N 53N	87W 87W	1950 1950	2,3,4,5 2,3,4,5 2,3,4,5	1	a. Numerals 1,2,3	,4 and 5 r	efer to	January 1	, Februa	ary 1, Ma	urch 1, A	oril 1 and Ma	у 1.
									Oloom Croek Granite Pass	751L 7517	9300 8950	32 19	55N 5UN	87w 88w	1956 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	b. Numerals refer		that sec	cures the	snow st				
Frido 200 51000010 - 4155 - 1725																		3. U. S. Geologia	ervice				8. Ci	ty of Boz	eriment Stat	
																		5. U. S. Indian S 6. National Park	Company	M -	Soil Moi	sture	10. U.	S. Fish	ter & Power   and Wildlife u of Reclama	Service
																		rark ;	octvice	A -	Aerial	larker	12. Mo:	ntane Sta	te Forestry	School
																								5, R-11,4	84 59M-46.	-3(3)

<sup>5,</sup>R-11,484 59M-46-3(3)

#### MONTANA SNOW SURVEYS ABOUT JANUARY 1, 1959

NT GO OFFI				7000	SNOW C	11	EASUREME		
MISSOURI DRAINAGE BASIN	-	-	Date	1959 Snow	Water	1	ast Reco Content		Total Years
AND			of	Depth	Content			15-Year	of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	Average 1938-52	Record
JEFFERSON RIVER									
(Rock-Beaverhead) #Camp Creek #Kilgore (Big Hole)	12E3 11E12	6800 6200	12/29	10	1.4	3.5 4.1	3.5	4.0%	21 21
Gibbons Pass Storm Lake #2	13D2 13C7	7100 7780	12/30 12/31	37 23	9.5 5.6	10.9	11.2	11.2** 7.4**	9
MADISON RIVER									And the second s
Hebgen Norris Basin 21-Mile	11E5 10E2 11E6	6550 7500 7150	1/3 1/2 1/4	20 19 25	3.4 3.7 5.1	5.0 3.7 6.1	6.6	5.6 4.7** 7.7*	24 5 20
W. Yellowstone #Big Springs	11E7 11E9	6700 6500	1/3 1/1	1) <sub>1</sub> 22	2.4	3.4 9.2	5.6 9.5	5.2* 7.4	21 23
#Island Park	11E10	3600	1/1	16	2.1	7.1	7.2	5.9*	23
#Valley View	11E8	6500	1/1	19	2.7	5.2	6.7	5.2*	22
GALLATIN RIVER									m 15 - 10 x - 10 illustration
21-Mile	11E6	7150	1/4	25	5.1	6.1	9.3	7.7*	20
MISSOURI RIVER M	AIN STE	M			of command and American				to the designation of the second seco
Chessman Res. Pipestone Pass Tenmile, Lower Tenmile, Middle Tenmile, Upper	1205 12D1 12G2 12G3 12C4	6200 7200 6250 6800 8000	1/2 1/2 1/4 1/3 1/3	12 9 18 25 33	2.0 1.4 3.5 5.8 7.5	1.4 2.2 2.7 4.7 5.6	0.1 - 2.2 3.9 5.2	2.1 3.3** 2.8 5.0 5.6	23 3 23 24 24
(Marias River) Marias Pass	13A5	5250	12/31	31	9.2	8.0	8.4	7.8	24
UPPER YELLOWSTONE	<u>E</u>				-				
Canyon Cooke City Lake Camp Lupine #Aster Creek #Thumb Divide	10E3 10D7 10E4 10E1 10E8 10E7	7750 7400 7850 7300 7700 7900	1/1 12/31 1/2 1/3 1/2 1/2	30 19 20 18 38 32	6.0 3.6 3.4 3.1 11.0 8.3	5.5 3.0 3.5 3.5 14.8	6.5 3.5 3.9 - 12.3 8.3	6.7** 4.0** 4.6** 4.4** 18.4**	12 12 10 6 7 7

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

\*\* Average for period of record.

# Adjacent Basin.



#### MONTANA SNOW SURVEYS ABOUT JANUARY 1, 1959

COLUMBIA				1959	SNOW C	7	EASUREM ast Reco	And production of the production of the party of the part	Total
DRAINAGE BASIN			Date	Snow	Water Content	7	Conten	t (In.)	Years
SNOW COURSE	No.	Elev.	Survey	Depth (In.)	(In.)	1958	1957	15-Year Average 1938-52	of Record
FLATHEAD RIVER						The second secon	1		
Coyote Hill Desert Mountain Marias Pass Spotted Bear Mt. Trout Lake Twin Creeks	13B10 13A2 13A5 13B2 13A12 13B11	4200 5600 5250 7000 3600 3580	1/2 12/31 12/31 1/7 1/5 1/6	18 33 31 38 33 32	4.9 7.6 9.2 9.9 6.8 6.2	4.8 6.1 8.0 5.4 5.7 4.1	4.8 6.4 8.4 5.9 4.9 3.5	5.0** 6.1** 7.8 6.5** 7.5** 4.1**	7 9 24 3 4 3
CLARK FORK						to the control of the			
Chessman Res. Coyote Hill Fish Lake Airstrip Lubrecht For. #6 Pipestone Pass Storm Lake #2 Tenmile, Lower Tenmile, Middle Tenmile, Upper TV Mountain #Lookout		6200 4200 5000 5400 7200 7780 6250 6800 8000 6800 5250	1/2 1/4 1/5 1/2 12/31 1/4 1/3 1/3 12/31 12/30	12 18 55 9 23 18 25 33 61	2.0 4.9 15.7 1.1 1.4 5.6 3.5 7.8 7.8 16.2	1.4 4.8 15.9 1.6 2.2 5.6 2.7 4.7 5.5 18.9	0.1 4.8 17.6 1.1 - 6.0 2.2 3.9 5.2 8.2 15.6	2.0 5.0** 16.9** 1.6** 3.3** 7.4** 2.8 5.0 5.6 7.8** 18.1**	23 7 5 8 3 23 24 24 21 2

<sup>\*</sup> Less than 15 yrs. in 1938-52 period. Average for 15 yrs. nearest the baseperiod. 
\*\* Average for period of record. 
# Adjacent Basin.



#### STATUS OF RESERVOIR STORAGE January, 1959

BASIN		USABLE	USA.	BLE STORAG	GE - 1000 A	ACRE FEET	-
& STREAM	RESERVOIR	CAPACITY 1000 A.F.		1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BA	ASIN - MONTANA				1		
Beaverhead Madison River Madison River Hyalite Creek Missouri River Missouri River	Lima Hebgen Lake Ennis Lake Middle Creek Canyon Ferry Hauser Lake & Lk. Helena Lake Helena	84.0 345.0 41.0 8.0 2043.0 62.5 10.4	168.7 39.4 3.9 1736.0	26.4 157.4 38.7 3.5 1651.0 63.1 10.7	7.1 156.5 38.0 2.8 1589.0 60.8 9.8	33.5* 241.6 34.1 3.3** 1412.0** 44.2* 7.1**	18 23 23 7 5
Missouri River N.Fk. Sun River N.Fk. Sun River N.Fk. Sun River N.Fk. Sun River Marias River Birch Creek Dupuyer & Birch Judith River Missouri River Milk River Milk River W. Rosebud Cr. Tongue River Swiftcurrent Cr.	Holter Lake Gibson Willow Creek Pishkun Tiber Swift Lake Francis Ackley Lake Ft. Peck 3/ Fresno Nelson Mystic Lake Tongue River Sherburne Lk.	81.9 105.0 32.3 32.0 1316.0 30.0 112.0 5.8 19410.0 127.2 66.8 20.8 73.9 66.1	69.9 62.9 26.7 19.9 - - - 8970.0 29.9 44.0 14.0 15.6 28.6	68.5 28.0 19.1 12.7 622.1 - 4.6 7670.0 57.7 51.4 9.8 9.0	73.5 38.6 22.9 17.0 627.1 21.2 90.0 3.4 6014.0 78.0 53.0 7.9 8.6 16.3	58.4 55.1 12.5 15.6 18.2 72.5 4.2* 11120.0* 55.8* 29.6 11.0 8.2* 17.3	21 23 23 23 23 23 23 20 18 18 23 23 23 22
MISSOURI RIVER BA	ASIN - WYOMING						
Shoshone River Wind River Wind River Bull Creek Belle Fourche	Buffalo Bill Boysen Pilot Butte Bull Lake Key Hole	440.0 408.6AC 31.6 152.0 190.0AC	6.1 65.7	189.4 322.4 14.4 75.1 1.2	143.9 240.6 9.2 76.0 12.5	270.8 2850.0** 12.9 63.9* 9.8**	2l <sub>4</sub> 7 23 19 6

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

<sup>\*\*</sup> Average for period of record.

3/ Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500.0 A.F.

AC Active storage - USBR Billings.



## STATUS OF RESERVOIR STORAGE January, 1959

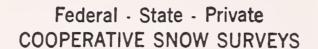
BASIN &		USABLE CAPACITY	USAB	LE STORAC	GE - 1000 A	ACRE FEET 1938-52	
STREAM	RESERVOIR	1000 A.F.	1959	1958	1957	AVG.	YRS.
MISSOURI RIVER B	ASIN - NORTH DAK	OTA	1				
Heart River Heart River Missouri River James River	Heart Butte Dickinson Garrison Lk. Jamestown	54.8AC 4.3AC 13805.0AC 20000.0AC	44.3 3.7 2860.2 12.5	56.3 4.3 4500.0 8.8	44.0 3.2 602.0 4.8	52.3** 3.8** -	8 7 4 2
MISSOURI RIVER B	ASIN - SOUTH DAK	ATO					
Belle Fourche Cheyenne River Cheyenne River Grand River Missouri River Missouri River Missouri River Cheyenne River	Belle Fourche Angostura Deerfield Shadehill Ft. Randall Gavins Point Oahe Pactola	185.0AC 160.0AC 15.1AC 84.0AC 4900.0AC 385.0AC	24.5 48.5 8.4 72.1 2091.0 287.0 240.0 18.2	59.6 56.7 11.0 79.4 1202.0 280.4 -	28.4 25.4 8.6 134.1 667.0 440.4	11.2** 134.0**	335542 - 2
COLUMBIA RIVER B	ASIN - MONTANA						
Flint Creek S.Fk. Flathead Flathead River Flathead River 6 Flathead River 7		3500.0 1791.0 42.8	29.2 3255.0 1478.0 23.2 25.7	21.5 2061.0 1013.0 25.4 18.1	21.1 1983.0 967.0 29.2 27.9	23.5* 2420.0** 895.0 19.6* 32.4*	19 5 15 18 18

6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

AC Active storage - USBR Billings.

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. \*\* Average for period of record.

<sup>7/</sup> Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.



Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"The Conservation of Water begins with the Snow Survey"